



International Swaps and Derivatives Association, Inc.

Disclosure Annex for Interest Rate Transactions

This Annex supplements and should be read in conjunction with the General Disclosure Statement. NOTHING IN THIS ANNEX AMENDS OR SUPERSEDES THE EXPRESS TERMS OF ANY TRANSACTION BETWEEN YOU AND US OR ANY RELATED GOVERNING DOCUMENTATION. Accordingly, descriptions in this Annex of the operation of Rates Transactions (as defined below) and the consequences of various events are in all cases subject to the actual terms of a Rates Transaction executed between you and us and its governing documentation (whether or not such qualification is expressly stated).

We refer to Transactions in which the Underliers are interest rates as “**Rates Transactions**” and to each specific interest rate that will serve as an Underlier as a “**reference rate.**” For example, a reference rate may be specified by referring to a particular trading screen of a financial information provider or to a government publication, such as Federal Reserve Statistical Release H.15. The definition of the reference rate may include a “fallback” method of determining the relevant interest rate if the named source fails to provide it at the relevant times, such as use of an alternative source or a determination based on quotations requested by the calculation agent for inter-bank borrowing rates.

The terms of a Rates Transaction may incorporate standard definitions published by industry bodies, annexes thereto and other market standard terms, which may in turn be amended or customized pursuant to the terms of the Rates Transaction and its governing documentation. Before entering into a Rates Transaction, you should obtain and review carefully any such materials incorporated by reference as their content could materially affect your rights and obligations under the Rates Transaction, its value and its appropriateness for your particular objectives.

Reference Rates

There is a wide range of reference rates for Rates Transactions. You should understand the methodology, characteristics and limitations of the reference rate selected for each Rates Transaction and consider carefully whether it is appropriate in light of your objectives for entering into the Rates Transaction. In certain cases, information about a reference rate may be publicly available from a compiling body, sponsor or administrator.

A reference rate may be compiled, sponsored or administered by an industry association, government agency, central bank, or enterprise or determined by the calculation agent designated under a Rates Transaction. Reference rates differ according to the particular type of borrowing cost that a rate is designed to measure, its methodology of compilation and applicable fallbacks. In certain Rates Transactions, the calculation agent may be authorized or required to make a determination that a reference rate or source is not representative of market conditions, or is otherwise flawed, and may designate an alternative reference rate or source.

In some cases, rates may be compiled from submissions of borrowing costs by contributing financial institutions. You should be aware that submissions may or may not be based on actual borrowing transactions or executable bids or offers and that the compiling body may not be able to audit submissions for their accuracy or completeness. The values of compiled rates can be affected by the particular circumstances of the submitting institutions, the financial markets in which they operate and the methodology of computation. Important factors in assessing the potential that a reference rate may be susceptible to distortion or manipulation include:

- computational procedures used by the compiling body to reduce the impact of potentially unrepresentative data, such as requiring a minimum number of submissions and the rejection of outlying data;
- conflicts of interest that may affect the submitting institutions or the compiling body;
- the information the compiling body publicly discloses, which may or may not accurately reflect all relevant information available to the compiling body; and
- governance of the compiling body, whether it is subject to regulatory oversight and the nature of such oversight.

The compiling body may make certain information relevant to this assessment publicly available, and we urge you to consider such information carefully. If we or an affiliate make submissions that are used to determine a reference rate and also act as principal in Rates Transactions that use the reference rate as an Underlier, then we face an inherent conflict of interest.

In other cases, reference rates may be derived from quoted prices or yields of fixed income securities or interest rate swaps. Such rates may be affected by supply and demand conditions for particular securities, government and private company decisions on the issuance of securities, and the functioning of and degree of participation in auctions and remarketing processes.

A compiling body, sponsor or administrator of a reference rate may make methodological or other changes that could change the value of the reference rate, including changes related to the method by which the reference rate is calculated, eligibility criteria applicable to securities, borrowers, submission contributors, funding sources or timing related to submissions or the publication of the reference rate. In addition, the compiling body, sponsor or administrator may alter, discontinue or suspend calculation or dissemination of the reference rate (in which case a fallback method of determining the reference rate may apply, if specified in the Rates Transaction).

Compiling bodies, sponsors and administrators of reference rates, the institutions that make submissions in the reference rate determination process, reference banks providing quotations pursuant to interest rate fallback provisions or otherwise, and developers of reference rates (including their participants) have no obligation to consider your interests in calculating, adjusting, converting, revising, discontinuing or developing any reference rate or fallbacks or in any of their submissions or quotations.

Regulatory and industry initiatives concerning benchmark rates or reference rates may result in changes or modifications affecting Rates Transactions or reference rates, such as a change in the compiling body, sponsor or administrator of a reference rate, the suspension, discontinuance or unavailability of a reference rate, the development of an alternative reference rate, a need to determine or agree a substitute or successor reference rate or alternative reference rate, and/or a need to determine or agree a spread to be added to or subtracted from, or to make other adjustments to, a substitute or successor reference rate or alternative reference rate to approximate a rate equivalent to the predecessor rate, not all of which can be foreseen at the time you enter into a Rates Transaction. You should consider how Rates Transactions and reference rates may be affected by such initiatives, changes and modifications, and the extent to which the definition of a reference rate together with fallbacks in such definition, if any, provide for such eventualities.

Any of the foregoing initiatives and actions could adversely affect a Rates Transaction, its liquidity and its Transaction Economics.

Terms of Rates Transactions

The detailed terms of each Rates Transaction, including reference rates, will determine the timing and amount of payments and other rights and obligations. A common feature of many but not all Rates Transactions is that payment obligations are defined in terms of a reference rate applied to a “**notional amount**” over an accrual or “**calculation period**.” For example, in its simplest form an interest rate swap is a transaction where one party agrees to make periodic payments to the other party of amounts accrued at one reference rate (e.g., a fixed rate) on the notional amount over a calculation period in exchange for payments by the other party accrued on the notional amount over the calculation period at another reference rate (e.g., the compounded average of a daily floating rate, such as SOFR over the calculation period). Other types of Rates Transactions are described below under “Additional Considerations for Specific Product Types”. Besides the reference rate, notional amount and calculation periods, other terms with which you should be familiar when you review any proposed Rates Transaction (which terms may vary even among Rates Transactions of the same type that trade in the same markets) may include:

- reset dates (i.e., dates during the term of a Rates Transaction on which a floating reference rate is measured and reset);
- the time period between the trade date and the date (often referred to as the “effective date”) on which the first calculation period begins;
- day count fractions;
- whether the calculation periods and payment dates of the two parties coincide, and whether under the terms of a Rates Transaction the calculations or payments are netted (i.e., subtracted arithmetically so that only the difference is payable by the party owing the larger amount);
- business day conventions;

- compounding or averaging conventions (which may apply for daily rates and for term rates if reset dates occur more frequently than payment dates);
- discounting factors (which may apply, or be implicit in stated figures, if amounts are paid prior to the end of a calculation period);
- the addition of a “spread” to the reference rate, including a spread that may vary depending on market conditions;
- changes in the notional amount during the term of a Rates Transaction, such as scheduled changes specified in the terms of an “amortizing swap” or “accreting swap”, or periodic adjustments under a “mark-to-market currency swap” to maintain a constant market value of a notional amount when measured in a different currency;
- other features, including options, that may (a) modify the value of a reference rate, such as barriers, multipliers, caps, floors or collars, (b) define payments based on the difference between a rate source and a specified level or on the number of days on which a reference rate is within or outside a specified range, or (c) trigger or terminate aspects of the Rates Transaction;
- circumstances under which the calculation agent may be required or permitted to override a rate source or designate a successor source; and
- specific fallbacks that apply when a floating reference rate is temporarily not available or has been permanently discontinued.

In some cases, a Rates Transaction may contain optional early termination provisions that require a cash settlement. These rights allow a party to terminate a Rates Transaction in whole or in part on one or more dates prior to the end of its scheduled term. Upon early termination, a cash settlement amount may be determined and become payable to the party for whom the Rates Transaction is in-the-money. Depending on the terms of the Rates Transaction, the cash settlement amount may be determined by the calculation agent based on market quotations or as the estimated replacement cost for payments and rights that are extinguished upon termination. In some cases, the cash settlement amount may be defined by specifying a computation to be applied to an observed par swap rate (i.e., the fixed rate prevailing in the market for a swap, the floating leg of which has specified material economic characteristics that are comparable to the swap for which the cash settlement amount is being determined), as reported by a specified source. (See “Reference Rates” above regarding rate sources generally). A similar determination of a cash settlement amount may apply if a Rates Transaction includes “mandatory early termination” provisions. In such Rates Transactions, the mandatory early termination date occurs (subject to any applicable conditions) prior to the end of the stated term. Consequently, the stated term will enter into the determination of the cash settlement amount, even though the Rates Transaction will not remain outstanding after the mandatory early termination date. If you enter into a Rates Transaction under which your counterparty has an optional early termination right that requires cash settlement or a Rates Transaction that includes mandatory early termination provisions, you should assess the potential magnitude of termination payments and your ability to pay them at the appropriate time. When we calculate the value of a Rates Transaction for any purpose, including in the event

of early termination, our interests will be adverse to yours. See IV.A.6 – “Conflicts of

Interest and Material Incentives – Our financial market activities may adversely impact Transactions – Act as calculation agent, valuation agent, collateral agent, or determining party” – of the General Disclosure Statement.

In other cases, a Rates Transaction may contain optional early termination provisions that allow one party to terminate the swap early without a cash settlement, with the result that the party for whom the Rates Transaction is in-the-money would lose the value of the Rates Transaction. If you enter into a Rates Transaction with a counterparty that has such an optional early termination right, you should assess the potential magnitude of the in-the-money amount you risk losing. See Section III.J – “Option Transactions present special considerations” – in the General Disclosure Statement.

No assurance that Rates Transactions are tailored to your hedging objectives

In some cases, you may contemplate entering into a Rates Transaction in order to hedge or mitigate interest rate exposures related to a particular borrowing or debt issuance, an anticipated transaction or as part of a general asset and liability management program. This may include, for example, entering into a fixed-for-floating interest rate swap to fix your interest costs in connection with a floating rate loan or other borrowing. The success of such a strategy will depend on the detailed terms of the Rates Transaction and the relevant loan agreement, bond indenture or debt instrument, as well as future conditions that may affect your ability to access markets, conditions affecting your lenders or liquidity providers and future changes in interest rates, exchange rates, yield curves and other market and economic factors.

Mismatches in the timing and amount of payments between a Rates Transaction and a specific loan agreement, bond indenture or other debt instrument could occur due to differences in the definitions of the reference rates governing the Rates Transaction and the debt instrument (including the use of different rate sources or the same rate source with different fallback provisions) or differences in other payment terms and conventions, such as the day count fraction, reset dates, designated maturities and business day conventions for payment dates.

Basis risk is the risk that the rate or yield of the asset or liability that you wish to hedge does not correlate perfectly with the reference rate selected under a Rates Transaction. Basis risk will generally be present unless the same reference rate is an explicit contractual term of both the Rates Transaction and the hedged asset or liability. Even then, other terms in the related debt instrument may cause actual borrowing costs to diverge from the reference rate. For example, loan agreements typically contain yield protection and/or increased costs provisions to compensate lenders for increased costs or reduced revenue associated with carrying the loan, including as a result of changes in taxes, withholding, reserves, assessments, and capital requirements.

Basis risk also may arise from differences in the liquidity characteristics of your debt obligations or your creditworthiness as compared to borrowers or issuers whose debt is used to establish a reference rate. Furthermore, historically stable relationships between different reference rates may break down. Examples observed during the recent financial crisis include divergences between LIBOR and overnight indexed swap (“OIS”) rates, as well as changes in the relationship between LIBOR and reference rates for tax-exempt debt. The relationship

between reference rates for taxable and tax-exempt instruments may be affected by changes in, or uncertainty about, future marginal tax rates and the tax treatment of comparable securities or other securities viewed by investors as substitutes.

If the asset or liability hedged by a Rates Transaction is prepaid or redeemed prior to maturity or amortizes at a faster rate than the notional amount of the Rates Transaction, then you may find yourself overhedged (i.e., having interest rate risk under the Rates Transaction that is no longer offset by a corresponding principal amount of the asset or liability). You should consider your ability and potential costs to terminate a Rates Transaction under such circumstances, and whether the excess notional amount remaining under a Rates Transaction might violate loan covenants or other contractual restrictions (such as investment guidelines) to which you or your assets are subject. In some circumstances, the cost of terminating a Rates Transaction may cause you to forego the flexibility afforded to you in the prepayment, call or redemption provisions of your debt instruments. In addition, a Rates Transaction may limit your ability to obtain release of collateral upon prepayment of a liability (for example, if you intend to refinance an asset with another lender) if such collateral also secures a Rates Transaction.

Additional Considerations for Specific Product Types

The following is a discussion of certain material risks, terms and characteristics of some common types of Rates Transactions. The categories employed below are illustrative only, and are intended to assist you in understanding key features of certain prospective Rates Transactions. The discussion should not be viewed as a comprehensive description of any particular Rates Transaction that may be under discussion between you and us. Because nomenclature is neither standardized nor sufficiently descriptive to capture all important transaction features and variations, a particular Rates Transaction may have additional or different risks, terms and characteristics than described below, even if it is referred to by one of the following category names.

Interest rate swaps

- *Fixed-for-floating*: In a fixed-for-floating interest rate swap, one party makes periodic payments based on a fixed rate that is agreed upon at the execution of the swap, while the other party makes payments based on a floating rate that may be reset periodically. From the perspective of a fixed rate payer, an increase in the overall level of fixed interest rates of the relevant tenors in the fixed-for-floating swap market (e.g., an upward shift of the relevant yield curve) will generally cause the swap to increase in value, because the fixed rate payer's contractually specified fixed rate obligations will be relatively lower with respect to the increased fixed rate then prevailing in the market. Conversely, if the overall level of fixed interest rates in the fixed-for-floating swap market falls, the value of the swap to the fixed rate payer will generally decline. From the perspective of the floating rate payer, the corresponding value changes will be reversed. Under certain fixed-for-floating interest rate swaps, known as "inverse floaters," the floating interest rate will be determined by subtracting the reference rate from a fixed level (among other features of the calculation), which causes the floating interest rate to fluctuate inversely with the level of the reference rate. In this case, an upward shift of the relevant yield curve would generally cause an inverse floater to decline in value from the perspective of the fixed rate payer, and vice versa.

- *Overnight indexed swap*: The term “overnight indexed swap” (“**OIS swap**”) generally refers to a fixed-for-floating swap in which the floating reference rate is an overnight rate. Because the interval between payments under an OIS swap typically encompasses multiple daily observations of the overnight rate, the payment computation must take these multiple values into account. Various methods are possible, including arithmetic averaging and daily compounding with various compounding conventions. The compounding conventions may be included within the definition of the reference rate, or may be explicitly provided for in the swap confirmation.
- *Single currency basis swap*: In a single currency basis swap, periodic payments are exchanged based on two floating reference rates, both denominated in the same currency, which may include two floating reference rates that are different designated maturities of the same underlying rate. The value of a basis swap generally is sensitive to changes in the relationship between the two floating rates, which in turn depends on market conditions affecting the supply and demand for funds or debt instruments in markets relevant for each reference rate. If the floating rates have different designated maturities, the value of the basis swap will be particularly sensitive to the shape of the relevant yield curve, and changes in its steepness or an inversion of the yield curve may result in significant losses. Accordingly, a basis swap with floating rates of the same underlying rate but different designated maturities may sometimes be referred to as a “steepener” or “flattener.” If leverage is applied to the applicable difference in the reference rates, or “basis,” any adverse movements of the reference rates from your perspective will be magnified.
- *Cross currency rate swap*: In a cross-currency rate swap, payments are exchanged based on either two floating reference rates, one floating rate and one fixed rate, or two fixed rates, each with a corresponding notional amount denominated in a different currency. Notional amounts are exchanged on the effective date and the maturity date, although in some transactions notional amounts are not exchanged, creating a coupon-only cross currency rate swap. In a mark-to-market cross-currency swap, the notional amount in one currency (the “variable currency”) will be adjusted to maintain a constant value in terms of the other notional currency (the “constant currency”), and in addition to the other amounts payable on a payment date the parties will exchange a mark-to-market payment based on the change in the value of the variable currency relative to the constant currency over the payment period. The value of a cross-currency rate swap will depend on interest rates and yield curves in each currency, as well as the spot and forward exchange rates between the two currencies. Cross-currency rate swaps generally involve an exchange of different currencies, in which case settlement risk will be present unless the parties have arranged an effective mechanism for payment-versus-payment settlement. See “Settlement Risk” in the Disclosure Annex for Foreign Exchange Transactions, published by the International Swaps and Derivatives Association, Inc. (“**FX Disclosure Annex**”). In some cases, the terms of a cross-currency rate swap may provide that amounts calculated in one or both of the notional currencies are converted into a settlement currency (which may be one of the notional currencies or may be a different currency) and netted. See the FX Disclosure Annex generally regarding considerations relevant to payments in foreign currencies and calculations based on exchange rates, including in particular the discussion of disruption

events and disruption fallbacks.

- *Forward starting swap*: The term “forward starting swap” generally refers to a fixed-for-floating interest rate swap where the terms are negotiated today but the swap does not initiate until some specified date in the future. Upon such date, a forward starting swap will operate as a typical fixed-for-floating interest rate swap does. For example, an investor who wants a swap with a three-year duration beginning one year from today can enter into a forward starting swap. Investors may wish to do this when they want to lock in certain rates that are being offered today. A forward starting swap can be equivalent to combining two spot fixed-for-floating swaps, and therefore the risks to investors are similar to those of fixed-for-floating swaps. From the perspective of the fixed rate payer, an increase in the overall level of fixed interest rates after the time the swap is executed will generally cause the forward starting swap to increase in value, because the fixed rate payer will have agreed to pay a rate that is now lower than prevailing rates. Conversely, if the overall level of fixed interest rates decreases, the value of the forward starting swap to the fixed rate payer will generally decline. From the perspective of the floating rate payer, the corresponding value changes will be reversed.
- *Accreting and amortizing swaps*: In a standard fixed-for-floating swap, the notional principal amount of the swap upon which the fixed and floating payments are made is fixed for the life of the swap. In an accreting swap, the notional principal amount of the swap grows over time. Therefore, the fixed rate payments will increase over time and the floating rate payments will be calculated based on a growing principal amount. Conversely, in an amortizing swap the notional principal amount of the swap decreases over time. The rate of accretion or amortization can be set to a specified level or tied to a reference rate. The pricing and valuation of accreting and amortizing swaps is no different than that of a fixed-for-floating rate swap. However, it should be noted that in the case of an accreting swap, exposure to changes in interest rates increases as time goes on, since the notional principal amount of the swap is increasing. Exposure to changes in interest rates decreases as time goes on in the case of an amortizing swap, since the notional principal amount of the swap is decreasing.
- *Constant maturity swap*: In a constant maturity swap, the floating rate payment is based on a reference rate or yield of a specified, constant maturity. That is, instead of being tied to a rate such as SOFR on each periodic reset, the floating rate leg will be periodically reset to what the fixed rate prevailing in the market at such time is for a swap with a given, constant maturity and a comparable opposite leg. This is called the “CMS rate.” The payment opposite the CMS rate leg may be a fixed rate, a standard floating rate or another CMS rate. The value of a constant maturity swap will depend on the shape of the yield curve. Generally, a constant maturity payer will benefit from a flattening or inversion of the yield curve and is exposed to the risk of the yield curve steepening. Other types of constant maturity swaps, including constant maturity Treasury swaps and constant maturity mortgage swaps, are similar to the constant maturity swap described above, except that the floating rate is based on a Treasury bond or a mortgage-backed security with a specified constant maturity, as applicable.
- *Range accrual swap*: A range accrual swap will have one or more legs that pay either a

fixed or floating rate payment, where interest only accrues at the specified rate on days on which one or more specified conditions is met. For example, interest may only accrue on such leg on days when SOFR is within a specified range or ranges. The party paying a simple fixed or floating leg and receiving payments based on any range accrual leg assumes the risk that the reference rate, level, price or other value will stay outside of the specified range or ranges in which interest accrues (or, more generally, that the specified accrual condition does not occur). The condition for accrual may be observed daily during each payment period or weekly, monthly or at such other time period as may be agreed upon by the parties. The range or ranges can stay the same throughout the life of the swap or could change according to a predefined schedule. If the accrual of interest is subject to conditions relating to two different Underliers (called a “dual range accrual swap”), then the swap will be subject to risks associated with both Underliers, and no interest will accrue if either Underlier is outside of the relevant range, even if the other is within the relevant range.

- *Zero coupon swap:* A zero coupon swap is a fixed-for-floating interest rate swap under which the fixed leg consists of a single fixed payment at maturity of the swap, rather than periodic payments over the term of the swap. The floating rate payer has increased credit exposure to the fixed rate payer under a zero coupon swap as compared to a conventional fixed-for-floating interest rate swap because of the greater amount that is owed to the floating rate payer by the fixed rate payer for a longer period of time. The floating rate payer also has increased exposure to fluctuations in general interest rates under a zero coupon swap as compared to a conventional fixed-for-floating interest rate swap because the floating rate payer will not receive fixed payments that it could otherwise reinvest at market rates throughout the term of the swap.
- *Inflation swap:* An inflation swap is a fixed-for-floating swap where the floating reference rate is a published measure of the rate of inflation. The value of an interest rate swap to a fixed rate payer will increase if expectations about the applicable measure of inflation rise, and decrease if expectations about the applicable measure of inflation fall. The converse is true for a floating rate payer under an inflation swap. The terms of the inflation swap will specify whether the floating payment will be based solely on the initial publication of the relevant inflation measure or whether it will be subject to adjustment if the relevant inflation measure is revised. If the relevant inflation measure is discontinued or is not published on a date of determination, the calculation agent (which may be us) may be required to select a substitute inflation measure or to calculate the relevant inflation level pursuant to an alternative methodology, which in either case may adversely affect the Transaction Economics from your perspective. The particular inflation measure underlying an inflation swap may exclude various categories of prices from the measure of inflation, which may have a significant effect on the measure of inflation. If your objective in entering into an inflation swap is to hedge other exposure that you have, you should consider carefully how well the particular inflation measure represents your other exposure. For purposes of valuing an inflation swap, observed market prices may be adjusted for seasonality, which may increase the level of uncertainty of the valuation. When we calculate the value of an inflation swap for any purpose, including in the event of early termination of an inflation swap, our interests will be adverse to yours. See IV.A.6 – “Conflicts of Interest and Material Incentives – Our financial market activities may adversely impact Transactions – Act as calculation agent, valuation agent, collateral

agent, or determining party” – of the General Disclosure Statement. Inflation swaps often have floors or caps or other option-like features. See “Options / Swaptions” below for a discussion of certain risks relating to such option-like features.

- *Other valuation considerations:* The value of an interest rate swap may be determined by reference to a series of forward rates for each future calculation period. A forward rate can be viewed as representing the currently prevailing fixed forward price of a particular future floating rate payment. Forward rates may be observable market rates in some cases, or may be interpolated from observed rates or implied by zero-coupon interest rates with tenors corresponding to the beginning and end of the relevant calculation period. In general, the portion of the value of an interest rate swap that is attributable to the exchange of payments on a given payment date may be determined by discounting a payment of the forward rate to present value at an appropriate discount rate (which may be based on a different yield curve than used to derive the forward rates) and comparing this amount to the discounted present value of the corresponding fixed rate payment, in the case of a fixed-for-floating swap, or the corresponding payment of the forward rate for the other floating leg, in the case of a basis swap. Consequently, the value will depend not only on the current level of the interest rates of the same designated maturity as the floating reference rate, but also on the entire yield curve up to the maturity date of the swap. The value may be affected by changes in the shape of the yield curve as well as the overall level of interest rates. For certain types of swaps under which payment flows do not correspond in timing or amount to payments on the traded instruments that define the reference rates, valuations may depend on volatilities of forward rates. The pricing of such swaps is inherently more complex than the pricing of simpler interest rate swaps that use forward looking term rates (e.g., Term SOFR) and generally requires use of models that describe fluctuations of the yield curve or approximated methods such as convexity adjustments. Examples of such swaps include arrears-setting swaps (i.e., in which a floating rate is set at the end of a calculation period and applied retroactively such as overnight SOFR or SONIA) and constant maturity swaps.

Forward rate agreements

A forward rate agreement (“**FRA**”) generally is an agreement to exchange payments based on the difference between (A) a fixed rate that is agreed upon at execution and (B) a floating rate that will be observed at some future date. If the FRA specifies a settlement date prior to the end of the accrual period for the observed floating rate, then the fixed and floating amounts that will accrue are discounted (typically using the observed floating rate to determine the discount factor) to their present value on the settlement date. This discount factor may differ from the rate at which you would be able to invest or borrow funds. Valuation considerations for FRAs are generally similar to those for interest rate swaps. The specified floating rate may be an interest rate, such as SOFR, or a yield on a specified bond, such as the yield on a specified U.S. Treasury bond. If your objective in entering into a FRA is to hedge the interest rate you will be required to pay under an expected future financing, you should consider whether the floating rate under the FRA is determined on the same basis as that on which the interest rate you are hedging will be determined. Any differences may reduce the effectiveness of the FRA for your hedging purposes. A FRA entered into for the purpose of hedging the interest rate you will be required to pay under an expected future financing may also be referred to as a “rate lock agreement.”

Options / Swaptions

Under an interest rate option, the parties have exposure to only one direction in the movements of a reference rate or the spread between reference rates. In the case of a call option, the “option buyer” pays a premium and will receive a payment from the “option seller” upon exercise if the reference rate or spread exceeds a specified strike level at the applicable time, and will otherwise not be entitled to any payment from the option seller. In the case of a put option, the option buyer pays a premium and will receive a payment from the option seller upon exercise if the reference rate or spread is less than a specified strike level at the applicable time, and will otherwise not be entitled to any payment from the option seller. If the option buyer pays the premium at the commencement of the Rates Transaction, the credit exposure under the Rates Transaction will be one-way (i.e., only the option buyer faces counterparty credit risk). If the option buyer pays the premium during or at the conclusion of the Rates Transaction, both parties will have counterparty credit risk.

A Rates Transaction commonly referred to as a “cap” is a series of call options on a specified reference rate, and a Rates Transaction commonly referred to as a “floor” is a series of put options on a specified reference rate. A party may enter into a cap or a floor as an individual Rates Transaction, or a cap and/or floor may be embedded in a Rates Transaction with other features.

A “collar” is a Rates Transaction in which one of the parties purchases a cap and sells a floor. The premium received from selling the floor may offset all or a portion of the premium for the purchased cap, or may in some instances be greater than the cap premium. As with other options, the sale of a floor or cap entails certain risks. See Section III.J – “Option Transactions present special considerations” – of the General Disclosure Statement. If you are considering purchasing a collar in order to hedge a floating rate borrowing, you should be aware that by selling the embedded floor you will forego any benefit from reduced borrowing costs if interest rates decline below the strike rate of the floor.

An interest rate swaption is an option that provides one party with the right, but not the obligation, to enter into an interest rate swap at an agreed-upon fixed rate on the specified future exercise date or dates. In a “pay-fixed” swaption, the holder of the swaption has the right to enter into an interest rate swap as a payer of the fixed rate and receiver of the floating rate, whereas in a “receive-fixed” swaption, the holder has the right to enter into an interest rate swap as a receiver of the fixed rate and a payer of the floating rate. In either case, the writer of the swaption has the obligation to enter into the opposite side of the interest rate swap from the holder. In some cases a swaption only uses the underlying swap as a means to determine the amount payable upon exercise of the swaption. In that case, the underlying swap will be treated as if it terminated immediately upon exercising the swaption.

Interest rate options and swaptions have the risks and characteristics described in Section III.J – “Option Transactions present special considerations” – of the General Disclosure Statement.

In some cases, you may decide to purchase an interest rate option or swaption to lock in interest rate hedging terms in advance of a future financing. You should be aware that if the future transaction is not consummated for any reason, you will have received no hedging benefit from the premium payment and other costs incurred in purchasing the

option or swaption.

In some cases, you may decide to sell an interest rate option or swaption. Selling an option or swaption may involve substantial risks. See Section III.J – “Option Transactions present special considerations” – of the General Disclosure Statement. Your objective in selling the option or swaption, for example, may be to capture the value of options you own, such as an option to redeem or prepay indebtedness, or your anticipated flexibility in determining when and whether to issue future indebtedness. You should be aware that such strategies are inherently risky, depend on a confluence of factors that are difficult to predict and may result in substantial losses.

A call option and a pay-fixed swaption generally increase in value as the underlying reference rate or spread, or the par swap rate (i.e., the value of the fixed rate at which a swap has zero present value) for the underlying swap, increases, assuming other relevant factors remain unchanged. The converse is true for a put option and a receive-fixed swaption. The price of any option or swaption will reflect both an intrinsic value component, which may be zero, and a time premium component. See Section III.J – “Option Transactions present special considerations” – of the General Disclosure Statement. The pricing of interest rate options and swaptions is inherently more complex than the pricing of many other options because the value is a function of the entire yield curve rather than a single market price. Valuation models differ in the parameters used to describe fluctuations of the yield curve, and may be significantly more complex than option pricing models employed for other asset classes based on a single volatility.

Options and swaptions have an exercise style, which may be European, American or Bermudan, and exercise may be subject to various conditions. You should review and understand the conditions and requirements for exercising an interest rate option or swaption and the consequences of exercise, as described in Section III.J of the General Disclosure Statement.

Forward volatility agreement

Under a typical interest rate forward volatility agreement, the parties agree on the trade date to enter into a “straddle” on a specified future date (the “reference date”) with terms that will be based on a volatility level that is agreed by the parties on the trade date. A “straddle” is a combination of a put option and a call option (or a pay-fixed swaption and a receive-fixed swaption) on a specified reference rate or spread (or underlying interest rate swap), both of which are purchased by the same party (the “option buyer”). The premiums for the options (or swaptions) will be determined by the calculation agent on the reference date based on the specified volatility level and other option pricing inputs as of the reference date. The strike prices for the options may also be determined by the calculation agent on the reference date based on such specified volatility level and/or other specified variables, or may be specified under the terms of the forward volatility agreement.

The specified volatility level may reflect an estimate or projection, as of the trade date, of what the implied volatility will be, on the reference date, for the specified reference rate, spread or underlying interest rate swap with respect to the period between the reference date and the expiration date. If such implied volatility, based on market prices for similar options or swaptions on the reference date, is less than the specified volatility level, then the

premiums paid by the option buyer will generally be greater than the market price of similar options on the reference date, and vice versa. For considerations relevant to the calculation of volatility, please refer to Section II.J – “General characteristics of variance- and volatility-linked Transactions” – of the General Disclosure Statement.

The calculation agent may be required to exercise judgment in determining the premiums and strike prices of the options or swaptions, and the calculation agent may make those determinations in a manner that is adverse to your interests. Please refer to Section IV.A.6 – “Act as calculation agent, valuation agent, collateral agent, or determining party” – of the General Disclosure Statement.

A forward volatility agreement is an agreement to buy or sell options, which have the risks and characteristics described in Section III.J – “Option Transactions present special considerations” – of the General Disclosure Statement.

Interest Rate Benchmark Modifications & Discontinuance

A compiling body, sponsor or administrator of an interest rate benchmark may make methodological or other changes that could change the value of the benchmark, including changes related to the method by which the benchmark is calculated, eligibility criteria applicable to contributing banks or funding sources, or timing related to submissions or the publication of the benchmark. In addition, the compiling body, sponsor or administrator may alter, discontinue or suspend calculation or dissemination of the benchmark (in which case a fallback method of determining the reference rate may apply, if specified in the relevant benchmark-based obligation or investment).

Regulatory and industry initiatives concerning benchmarks may result in changes or modifications affecting benchmark-based obligations and investments or benchmarks, such as a change in the compiling body, sponsor or administrator of an benchmark, the suspension, discontinuance or unavailability of an benchmark, the development of an alternative reference rate (“ARR”), a need to determine or agree a substitute or successor reference rate or ARR, and/or a need to determine or agree a spread to be added to or subtracted from, or to make other adjustments to, a substitute or successor reference rate or ARR to approximate an benchmark equivalent rate (as further described below), not all of which can be foreseen at the time you enter into, issue or acquire an benchmark-based obligation or investment. You should consider how benchmark-based obligations and investments and benchmarks may be affected by such initiatives, changes and modifications, and the extent to which the definition of a benchmark together with fallbacks in such definition, if any, provide for such eventualities.

Compiling bodies, sponsors and administrators of benchmarks, contributing banks on the relevant benchmark panel, reference banks providing benchmark quotations pursuant to interest rate setting or fallback provisions or otherwise, and developers of ARRs (including their participants) have no obligation to consider your interests in calculating, adjusting, converting, revising, discontinuing or developing any benchmark, ARR or fallbacks or in any of their submissions or quotations.

Any of the foregoing initiatives and actions, any delay or uncertainty regarding the same, or

any failure of an ARR to be developed or gain market acceptance, could adversely affect benchmark-based obligations and investments and their economics, including the price, value or liquidity of benchmark-based obligations and investments, their usefulness for your intended purpose, the timing or amount of payments or deliveries and, if applicable, the likelihood that you will be able to exercise any option rights.

Interest Rate Benchmark-Equivalency and Risks

If the composition or characteristics of an ARR differ in any material respect from those of a benchmark, such as an ARR that represents overnight secured funding transactions involving bank and non-bank market participants, it may be necessary to convert the ARR into benchmark-equivalent rates in a range of maturities before it is considered a suitable substitute or successor for the relevant benchmark.

Converting an ARR into one or more benchmark-equivalent rates may be possible by adding, subtracting or otherwise incorporating one or more interest rate spreads, or by making other appropriate adjustments, to the ARR to approximate a benchmark-equivalent rate. For example, statistical correlations between the performance of the ARR versus a benchmark in a range of maturities over time or for specific periods or points in time prior to a suspension, discontinuance or unavailability of a benchmark could serve as a basis for computing and incorporating spreads or making other adjustments to the ARR. The feasibility and appropriateness of such adjustments may depend on a variety of considerations, including market conditions, any disparate impact of monetary policy (or macroeconomic changes such as Brexit) on the respective rates during the observation period, and factors affecting the ARR's or a benchmark's integrity over the observation period, including liquidity, transaction volumes, the number and financial condition of contributing or reference banks, and other considerations.

Even with spreads or other adjustments, benchmark-equivalent ARRs may be only an estimate or approximation of the relevant benchmark, may not be subject to continued verification against the relevant benchmark if it is suspended, discontinued or unavailable, and may not result in a rate that is the economic equivalent of the specific benchmarks used in your benchmark-based obligations and investments. In addition, it may be necessary to make such spreads or other adjustments permanent in response to the suspension, discontinuance or unavailability of the relevant benchmark, in which case such spreads or other adjustments may reflect an historical correlation or relationship between the relevant rates without taking into account future potential changes in the markets the benchmark was initially intended to represent.

It is impossible to predict with any certainty whether and how conversions of ARRs into benchmark-equivalent rates would or could be made and by whom. For example, conversions and adjustments could be made by developers of ARRs or by compiling bodies, sponsors or administrators of ARRs, or by a method or mechanism established by them. Due to competition laws or other legal constraints, developers and other market participants may be unable or reluctant to act collectively in certain respects in reforming or replacing benchmarks, such as setting or agreeing spreads or making other adjustments to ARRs at the financial industry level without central bank or government involvement, endorsement or other intervention.

If ARR's are developed with the expectation that conversions would be made bilaterally in the context of individual contracts, transactions, undertakings or investments, then decisions whether and how to convert them into approximations of benchmark-equivalent rates, including establishing processes for doing so, may be left to the parties, or their calculation agents or determining parties under benchmark-based obligations and investments, subject to whatever agreements, amendments, approvals, consents or other actions that may be necessary or required.

Alternatively, if the applicable interest rate under a benchmark-based obligation or investment is a combination of a benchmark and an agreed spread, it may be that the agreed spread is to be adjusted instead.

In either case, you should expect that our interest, involvement or role in benchmark-based obligations and investments will vary, and we may make decisions and act independently with respect to each such benchmark-based obligation or investment, without any obligation to treat all benchmark-based obligations and investments alike, including, without limitation, agreeing or applying the same spreads or adjustments to ARR's for purposes of converting them into approximations of benchmark-equivalent rates.

Potential Insufficiency of Fallbacks

Just as benchmarks remain vulnerable to contributing bank withdrawals, certain benchmark fallback provisions that call for the polling of reference banks could likewise be vulnerable if reference banks are reluctant to provide benchmark quotations, perhaps for reasons similar to those of withdrawing contributing banks. Better suited for a temporary benchmark interruption, such polling of reference banks under primary or secondary fallbacks may also become impractical if carried out on a large scale or for prolonged periods in response to the discontinuance of a benchmark.

Fallbacks currently in use in the financial markets may not necessarily contemplate the substitution of benchmark with another rate, or in certain cases they could be commercially suboptimal, such as with respect to an interest rate swap hedging a floating rate note issuance, for example, where the note's benchmark fallback provisions lead to a different fallback rate than the related swap. Such a result could undermine a noteholder's hedging strategy, since benchmark fallback provisions used in ISDA definitional booklets for swaps may not match those of the underlying hedged asset or investment. Accordingly, it may become necessary or desirable in the future to replace benchmarks with ARR's in your benchmark-based obligations and investments, which may require that other parties or interested persons agree, approve or consent.

The Need for Future Amendments

Replacing benchmarks with ARR's may not be possible unless appropriate amendments are made in the future to contracts, transactions, undertakings or investments, either bilaterally or through an ISDA protocol or other multilateral amendment process, assuming such methods are developed. Whether these methods are successful may depend, in part, on market acceptance of ARR's.

You may also need to evaluate the pros and cons of provisions that permit unilateral amendments in response to benchmark discontinuance, or that authorize a calculation agent or other determining party to use its discretion in administering fallbacks, selecting a substitute or successor rate or ARR, or making benchmark-equivalency determinations. For example, swaps that are part of a financing may have indentures that could specify that the issuer and the trustee may enter into a supplemental indenture to replace a discontinued benchmark without requiring the consent of floating rate note holders.

You should review the scope of the duties of the calculation agent under your contracts and the applicable standards of care. If you will be acting as a calculation agent or determining party, you may wish to consider your exposure to litigation risk if parties dispute your calculations and determinations under fallback provisions, especially if you are called upon to use your discretion.